Intensivierung in Mathematik	**5. Übungsblatt - Lösungen**

1. a) $\frac{2}{3} = \frac{8}{12}, \frac{7}{12} = \frac{7}{12}$ b) $\frac{3}{5} = \frac{9}{15}, \frac{8}{15} = \frac{8}{15}$ c) $\frac{20}{13} = \frac{100}{65}, \frac{49}{65} = \frac{49}{65}$

d) $\frac{2}{3} = \frac{8}{12}, \frac{3}{4} = \frac{9}{12}$ e) $\frac{3}{8} = \frac{75}{200}, \frac{17}{25} = \frac{136}{200}$ f) $\frac{5}{13} = \frac{55}{143}, \frac{6}{11} = \frac{78}{143}$

g) $\frac{5}{6}, \frac{3}{6}$ sind gleichnamig h) $\frac{5}{6} = \frac{25}{30}, \frac{9}{10} = \frac{27}{30}$ i) $\frac{3}{10} = \frac{18}{60}, \frac{5}{12} = \frac{25}{60}$

j) $\frac{7}{9} = \frac{28}{36}, \frac{7}{12} = \frac{21}{36}$ k) $\frac{17}{30} = \frac{102}{180}, \frac{19}{36} = \frac{95}{180}$ l) $\frac{25}{36} = \frac{145}{180}, \frac{49}{60} = \frac{147}{180}$

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2. a) $\frac{2}{3} = \frac{8}{12}, \frac{3}{4} = \frac{9}{12}, \frac{7}{12} = \frac{7}{12} \Rightarrow \frac{7}{12} < \frac{2}{3} < \frac{3}{4}$

b) $\frac{3}{5} = \frac{18}{30}, \frac{5}{6} = \frac{25}{30}, \frac{11}{15} = \frac{22}{30} \Rightarrow \frac{3}{5} < \frac{11}{15} < \frac{5}{6}$

c) $\frac{5}{8} = \frac{75}{120}, \frac{7}{10} = \frac{84}{120}, \frac{11}{12} = \frac{110}{120} \Rightarrow \frac{5}{8} < \frac{7}{10} < \frac{11}{12}$

d) $\frac{11}{18} = \frac{110}{180}, \frac{13}{20} = \frac{117}{180}, \frac{22}{45} = \frac{88}{180} \Rightarrow \frac{22}{45} < \frac{11}{18} < \frac{13}{20}$

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3. a) $2\frac{4}{9} = 2\frac{16}{36}, 2\frac{7}{12} = 2\frac{21}{36} \Rightarrow 2\frac{4}{9} < 2\frac{21}{36}$ b) $-3\frac{5}{6} < 3\frac{7}{10}$

c) $-\frac{7}{8} = -\frac{77}{88}, -\frac{10}{11} = -\frac{80}{88} \Rightarrow -\frac{10}{11} < -\frac{7}{8}$ d) $-\frac{11}{15} < \frac{9}{16}$

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4. a) $\frac{28}{5} = 5\frac{3}{5}$ b) $-\frac{97}{4} = -24\frac{1}{4}$ c) $\frac{91}{12} = 7\frac{7}{12}$

d) $-\frac{163}{15} = -15\frac{13}{15}$ e) $-\frac{345}{11} = -31\frac{2}{11}$

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5. a) $16\frac{1}{2} = \frac{33}{2}$ b) $13\frac{4}{5} = \frac{69}{5}$ c) $12\frac{5}{8} = \frac{101}{8}$

d) $-3\frac{4}{5} = -\frac{19}{5}$ e) $-9\frac{11}{12} = -\frac{119}{12}$ f) $15\frac{8}{15} = \frac{233}{15}$

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6. a) $\frac{3}{20} = \frac{15}{100} = 15\%$ b) $\frac{4}{25} = \frac{16}{100} = 16\%$

c) $1\frac{1}{4} = \frac{5}{4} = \frac{125}{100} = 125\%$ d) $\frac{18}{150} = \frac{6}{50} = \frac{12}{100} = 12\%$

e) $2\frac{3}{5} = \frac{13}{5} = \frac{260}{100} = 260\%$ f) $\frac{33}{88} = \frac{3}{8} = \frac{75}{200} = 37{,}5\%$

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7. a) $36\% = \frac{36}{100} = \frac{9}{20}$ b) $115\% = \frac{115}{100} = \frac{23}{20}$

c) $245\% = \frac{245}{100} = \frac{49}{20} = 2\frac{9}{20}$ d) $2{,}5\% = \frac{5}{200} = \frac{1}{40}$

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8. $85\% \triangleq 340\,€ \Rightarrow 5\% \triangleq 340\,€ : 17 = 20\,€ \quad 15\% \triangleq 30\,€ \cdot 3 = 60\,€$

Frank erhält 60 € Preisnachlass.

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9. a) 5% von 1860 Liter $= \frac{1}{20}$ von 1860 Liter $= 1860\,€ : 20 = 93$ Liter.

Der Verbrauch im Jahr 2010 betrug 1953 Liter.

b) 1950 Liter − 1872 Liter = 78 Liter

78 Liter von 1950 Liter $= \frac{78}{1950} = \frac{39}{975} = \frac{13}{325} = \frac{1}{25} = \frac{4}{100} = 4\%$

Der Verbrauch an Heizöl nahm um 4% ab.

c) $4\% \triangleq 60$ Liter $\Rightarrow 100\% \triangleq 60$ Liter $\cdot 25 = 1500$ Liter

Die Schulzes verbrauchten im 1440 Liter Heizöl im Jahr 2010 und 1500 Liter im Vorjahr.

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10. a) $\frac{792}{936} = \frac{11}{13}$ b) $\frac{560}{728} = \frac{10}{13}$ c) $\frac{495}{675} = \frac{11}{15}$

d) $\frac{10 \cdot 17 \cdot 24}{12 \cdot 50 \cdot 51} = \frac{1 \cdot 1 \cdot 24}{12 \cdot 5 \cdot 3} = \frac{2}{15}$ e) $-\frac{1197}{2079} = -\frac{19}{33}$

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11. a) $48 : 15 = \frac{48}{15} = \frac{16}{5} = 3\frac{1}{5}$ b) $-64 : 44 = -\frac{64}{44} = -\frac{16}{11} = -1\frac{5}{11}$

c) $132 : (-36) = -\frac{132}{36} = -\frac{11}{3} = -3\frac{2}{3}$

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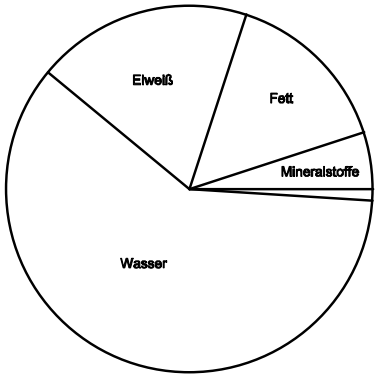
12. Erstelle ein Kreisdiagramm.

5% von $360° = \frac{1}{20}$ von $360° = 360° : 20 = 18\%$

15% von $360° = 18° \cdot 3 = 54°$

19% von 360° $= \frac{19}{100}$ von 360° $= (360° : 100) \cdot 19 = 3{,}6° \cdot 19 = 68{,}4°$

60% von 360° $= \frac{60}{100}$ von 360° $= \frac{6}{10}$ von 360° $= (360° : 10) \cdot 6 = 36° \cdot 6 = 108°$



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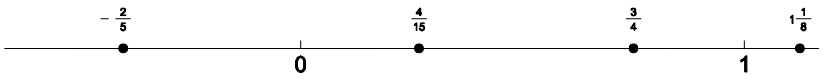
13. $\frac{3}{4}$ von 6 cm $= (6 \text{ cm} : 4) \cdot 3 = 15 \text{ mm} \cdot 3 = 45 \text{ mm} = 4{,}5 \text{ cm}$

$\frac{2}{5}$ von 6 cm $= (6 \text{ cm} : 5) \cdot 2 = 2{,}4 \text{ cm}$

$\frac{9}{8}$ von 6 cm $= (60 \text{ mm} : 8) \cdot 9 = 7{,}5 \text{ mm} \cdot 9 = 67{,}5 \text{ mm}$

$\frac{4}{15}$ von 6 cm $= (60 \text{ mm} : 15) \cdot 4 = 16 \text{ mm}$



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14. 1 cm von 8 cm $= \frac{1}{8}$ d.h. $\frac{1}{2}$ cm $\triangleq \frac{1}{16}$. Es handelt sich um die Zahl $\frac{7}{16}$.

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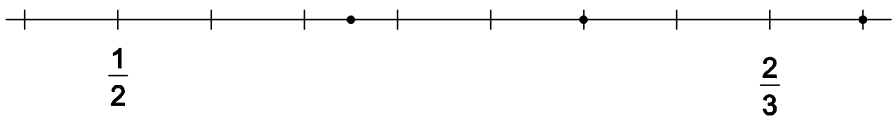
15. $\frac{4}{5} = \frac{16}{20}$ und $\frac{3}{4} = \frac{15}{20}$ Es handelt sich um den Bruch $\frac{15}{19}$.

16.



$\frac{1}{2} = \frac{12}{24} = \frac{24}{48}$ und $\frac{2}{3} = \frac{16}{24} = \frac{32}{48}$.

Damit beträgt der Abstand zweier nachbarter Striche $\frac{1}{48}$.

Erster Punkt: $\frac{53}{96}$ Zeiter Punkt: $\frac{29}{48}$ Dritter Punkt: $\frac{33}{48}$
